



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,926	02/25/2004	Jalal Ashjaee	NT-216C1-US	1956

7590

03/07/2005

NuTool Inc.  
Legal Department  
1655 McCandless Drive  
Milpitas, CA 95035

EXAMINER

NGUYEN, GEORGE BINH MINH

ART UNIT

PAPER NUMBER

3723

DATE MAILED: 03/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/788,926

Applicant(s)

ASHJAE ET AL.

Examiner

George Nguyen

Art Unit

3723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,9-17 and 39-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 39-56 is/are allowed.
- 6) ☒ Claim(s) 1,12-16,39,44,49 and 52-54 is/are rejected.
- 7) ☒ Claim(s) 9-11,17,40-43,45-48,50,51,55 and 56 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 022504.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

Receipt is acknowledged of Applicant's amendment filed on February 25, 2004.

Claims 2-8 and 18-38 were canceled. Claims 39-56 were added.

Thus, claims 1, 9-17, and 39-56 are presented for examination.

Receipt is acknowledged of the IDS filed on February 25, 2004 which has been considered and placed of record in the file.

### ***Claim Objections***

1. Claim 12 is objected to because of the following informalities: claim 12 depends on canceled claim 8. For the purpose of examination, the examiner considered it to depend on claim 1. Appropriate correction is required.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations of "pad" in claims 54 and 56 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

Art Unit: 3723

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 54 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for electrochemical deposition, does not reasonably provide enablement for **electrochemical mechanical deposition of material to the frontside of the substrate using the pad**. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use or make the invention commensurate in scope with this claim. Figure 2 discloses no pad between the frontside of the substrate and the processing chamber. It is the examiner's understanding from reading the specification that the pad is primarily used during the electrochemical mechanical polishing.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 3723

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 53 and 55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding the limitations of "process" in lines 1-2 of both claims 53 and 55, it is confusing to claim a process within an apparatus claims since the scope of the claims is unascertainable because it is unclear how the process limitations further limit the apparatus claims.

***Claim Rejections - 35 USC § 102***

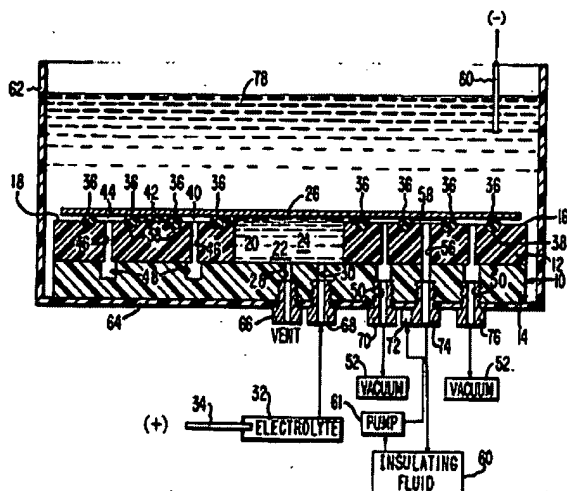
7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 12, 39, 44, 49, and 52-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Gibbs' 4,043,894.

With reference to Figure 2, col. 2, line 56 to col. 3, line 26, Gibbs discloses an electrochemical processing apparatus for a semiconductor comprising an inner seal member (second O ring 36 from the center), and an outer seal member (4<sup>th</sup> O ring 36 from the center).



A plurality of concentric resilient rubber O-rings 36 surround the recess 22 on the upper surface 18 of the disk. In this embodiment, the O-rings lie in corresponding grooves 38 in the disk upper surface 18. O-rings 38 provide a plurality of coplanar ridges projecting from the disk upper surface 18 for receiving the wafer 26. Resilient O-rings are preferred because they provide a good seal to the wafer 26 and can be periodically replaced to insure a consistent seal. However, it is contemplated that ridges could be formed as an integral part of the disk 16 if coplanarity can be maintained. It should be noted that the ridges need not necessarily be concentric or circular as long as that they are continu-

### 3

ous or closed-looped and that each continuous ridge has a progressively larger perimeter as they extend towards the outer periphery of the disk surface 18.

Adjacent O-rings 36 define a plurality of channels in the disk upper surface 18. In this embodiment, there are three concentric channels 40, 42 and 44 as they extend outward from recess 22. Channels 40 and 44 are vacuum channels, whereas channel 42 contains an insulating fluid as will be later described. Vacuum channels 40 and 44 each include a plurality of equally spaced openings 46 which extend through the upper disk portion 12. Openings 46 open into subjacent grooves 48 in the lower portion 14 of the disk. While the openings 46 are equally spaced in the disk upper portion 12, the grooves 48 are each continuous in the lower portion 14. Consequently, before joining the upper disk portion 12 and lower portion 14 together, the openings 46 can be drilled in the upper portion 12 and the grooves 48 can be machined into the lower portion 14. As these are relatively simple operations, the fixture can be manufactured at relatively low cost. Each groove 48 has a threaded opening 50 extending through the lower disk portion 14. Openings 50 provide a passageway for connecting with a source of vacuum 52. The vacuum source 52 thus communicates through grooves 48 and openings 46 to secure the wafer 26 against the O-rings 36.

Please note that phrases of "adaped to" found in claim 1 do not distinguish the claim

limitations over the prior art. It has been held that the recitation that an element is

"adapted" to perform a function is not a positive limitation but only requires the ability to

Art Unit: 3723

so perform. In this instant, even though wafer 36 submerges in processing solution during processing; however, the O-rings 36 is capable assisting in preventing the solution from reaching the backside inner region of wafer 36.

In col. 4, lines 25-50, Gibbs discloses that the O rings keeps the wafer backside from being anodized while the front side of wafer is being anodized.

42. In such manner the possibility of the positive electrode 34 and negative electrode 80 being shorted together by the conductive liquids is substantially reduced. Moreover, vacuum channels 40 and 44 will draw any of the anodizing solution 78 out through the lower portions of the fixture before it can short to the electrolyte 24. A fluid separating reservoir may be utilized to cooperate with vacuum source 52 to recapture the solution. It is also a feature of this invention that the entire wafer frontside is anodized with this fixture unlike the prior art fixtures where the clipped edges must remain outside of the anodizing solution and are consequently not anodized. Moreover, the wafer backside (except possibly for the extreme outer edges) is protected from unwanted anodization without the necessity of an insulating coating. It will be understood that the overall

Regarding to the limitations of "removable seal" in claims 39 and 52 in col. 4, lines 48-50, Gibbs discloses that the O-rings 36 can be periodically replaced to insure that a good seal to the wafer is maintained. In view of the ordinary meaning of the word "removable", that is "that can be removed", the examiner believes that Gibbs's O-rings being replaceable read on the "removable" limitations.

Regarding to the limitations of 'contacts' in claim 52, Gibbs discloses electrode 80 and a plurality of fluid contacts to supply power to the front side of substrate 26.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 3723

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbs'4,043,894 in view of Fratello et al.'5,655,677.

Gibbs has been discussed above, but does not disclose a hollow O ring for sealing purpose.

With reference to Figure 2D, col. 5, lines 43-67, Fratello discloses that a hollow O-ring 90 would advantageously provide a fully compressed seal to achieve a fluid tight seal.



is, a hollow O-ring is employed. When the engagement surfaces 42, 80 are in contact, as seen in FIG. 2D, the hollow sealing member or O-ring 90 is compressed using the nub 84 and the boss 86, which causes a flattening of the sealing member 90 and a reduction in the size of the hollow portion thereof. The hollow O-ring 90 acts to eliminate or substantially reduce a problem that can occur over repeated openings/closings of the carrier vessel 16. Specifically, as a result of such repeated openings/closings, a non-hollow sealing member may not compress as fully as before, thereby jeopardizing or reducing the leakage protection function associated with the sealing member 90. In one embodiment, the outer diameter of the hollow O-ring is in the range of  $\frac{1}{8}$ – $\frac{3}{16}$  inch and has a thickness in the range of 0.020–0.050 inch. Such a sealing member 90 also has a durometer reading in the range of 10–50 Shore A. The combination of the nub 84, boss 86 and hollow sealing member 90 serves two main functions. Sufficient compressive forces on the sealing member 90 result in a fluid tight seal, which is at least the same or comparable to the embodiment of FIGS. 2A–2B. Furthermore, due to the relatively smaller contact or compressing engagement between the nub 84 and the sealing member 90, in contrast to the contact between the free end of the tongue member 42 and the sealing member 90 in the embodiment of FIGS.

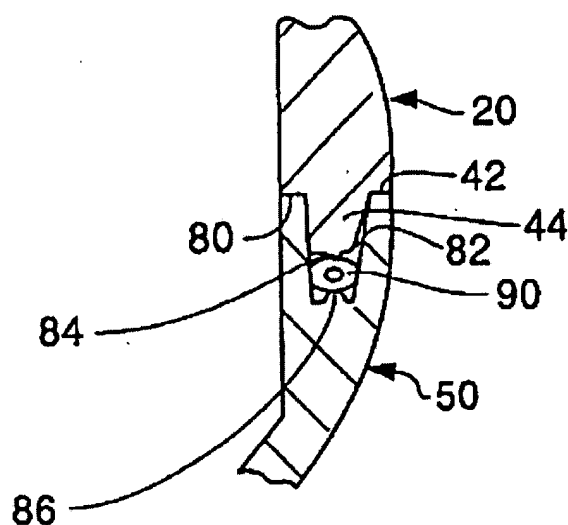


Fig. 2D

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the solid O ring of Gibbs with a hollow O ring as

Art Unit: 3723

taught by Fratello in order to advantageously provide a fully compressed seal to achieve a fluid tight seal.

***Allowable Subject Matter***

2. Claim 9-11, 17, 40-43, 45, 46, 47, 48, 50, 51, and 55-56 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

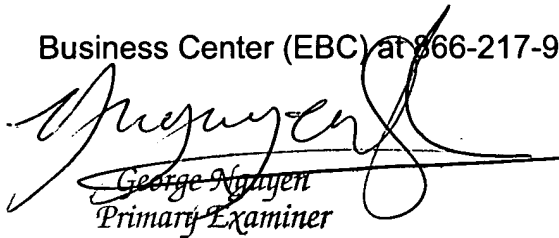
3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The attached PTO-892 provides a list of relevant arts for the claimed subject matter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Nguyen whose telephone number is 571-272-4491. The examiner can normally be reached on Monday-Friday/630AM-300PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Hail can be reached on 571-272-4485. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3723

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



George Nguyen  
Primary Examiner

George Nguyen  
Primary Examiner  
Art Unit 3723

GN – February 25, 2005